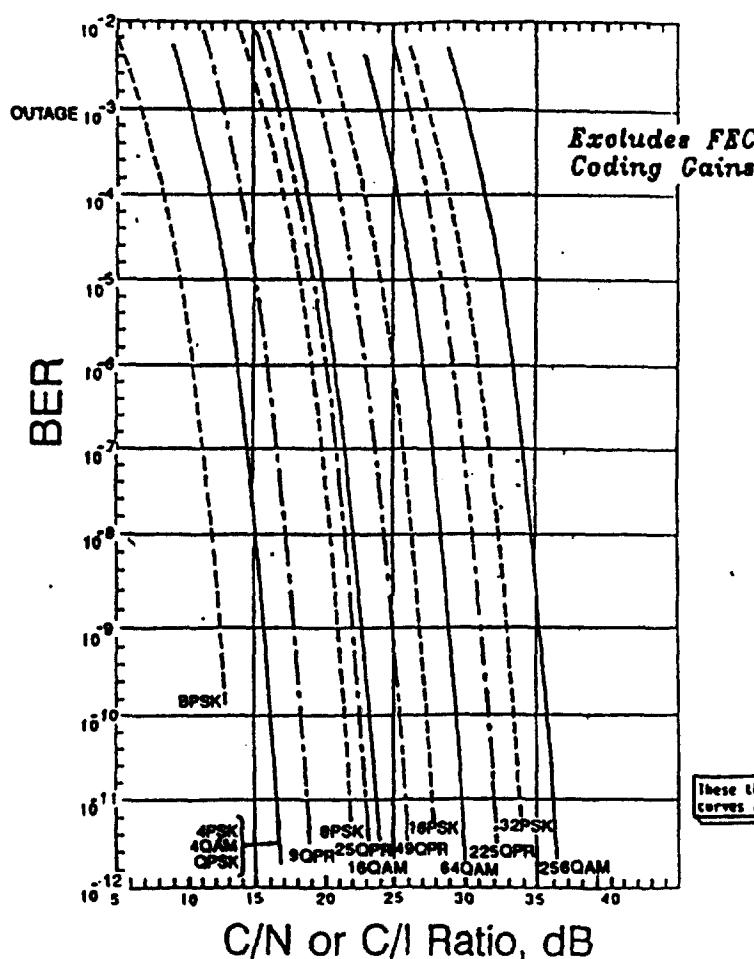


## Digital Radio BER vs. C/N



Digital Radio Theoretical  
BER vs. C/N or C/I Ratios:

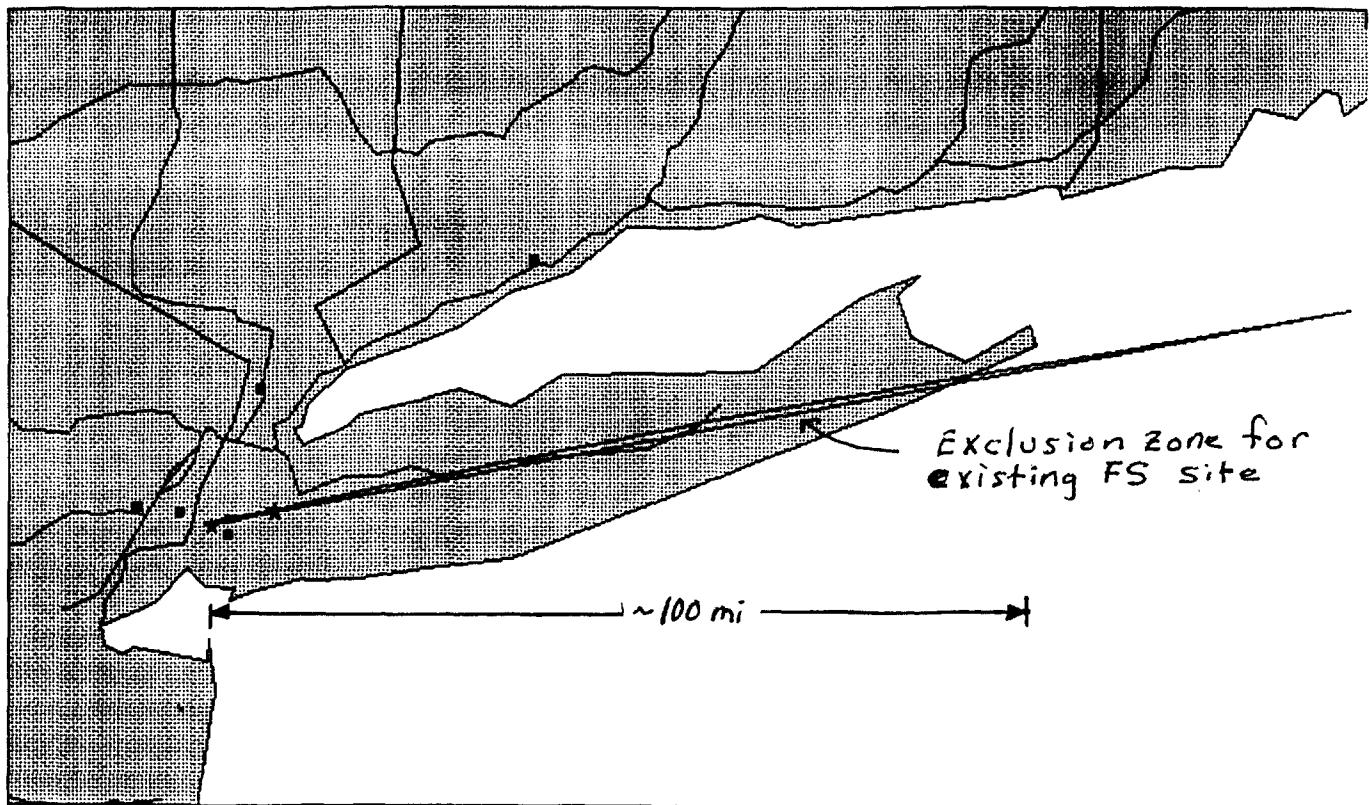
- Thermal Noise (Fades)
- Co-channel Interference
- Antenna system echoes
- Multipath echoes

These theoretical BER vs. CNR "waterfall" curves are printed in most digital textbooks.

From Ferenc's  
Textbook on digital  
modems

## Digital Radio RF and Noise Level Terminology

- All digital radio performance (outage and quality) is derived from carrier-to-noise (C/N or CNR) and carrier-to-interference (C/I or CIR) ratios, as shown on the following sketches.
- To digital radios (unlike analog radios), thermal noise (with deep fades), interference, antenna feeder system echoes, and multipath echoes all have similar effect (given equal CNR's or CIR's) on performance.



Assumptions: FS EIRP = 20.2 dBW/MHz

Earth Station  
Sensitivity = -155 dBW/MHz

Earth Station  
Elevation Angle = 10°